NOTES

PASSIFLORA EGLANDULOSA, A NEW SPECIES IN SECTION *CIECA* (MEDIKUS) DC. FORMERLY INCLUDED WITH *P. TRINIFOLIA* MASTERS

Passiflora trinifolia Masters "is very common in the forests of the Occidente" of Guatemala according to Standley & Williams (1961). Indeed, this name has been applied to a locally abundant apetalous passionflower of the wet montane forests of northern Central America. However, while preparing a revision of *Passiflora* L. section *Cieca* (Medikus) DC., extreme and bimodal variation of vegetative characters was noted among the specimens circulated as *P. trinifolia*. Consequently, closer analysis revealed the existence of two distinct species: the actually very rare *P. trinifolia*, and the more common but previously unnamed species described below.

Passiflora eglandulosa MacDougal, sp. nov. TYPE. Guatemala. San Marcos: wet mountain forest at Aldea Fraternidad, W-facing slope of Sierra Madre between San Rafael Pie de La Cuesta and Palo Gordo [ca. 14°56′N, 91°52′W], 1,800–2,400 m, 10–18 Dec. 1963, *Williams, Molina & Williams 25997* (holotype, F; isotypes, ENCB, G, NY, S, US, W—2 sheets). Figures 1, 2B, 3.

Passiflora ad sectio *Cieca* pertinens, scandens; stipulae ovatae 2.5–9 mm latae; petioli eglandulosi; folia eglandulosa trilobata haud peltata, lobis acuminatis vel caudatis, lobo centrali quam lateralibus longiori, marginibus integris; pedunculi ebracteati; petala nulla; coronae filamenta biseriata, filamentis exterioribus 3–4 mm longis, usque ad 0.2–0.3 mm diametro, filamentis interioribus ad 1.5 mm longis; operculum plicatum; ovarium glabrum; semina reticulato-foveata.

Slender, climbing, perennial herb 2–4 m long, minutely puberulent and sparsely to lightly pubescent with trichomes of 2 size classes: smaller (microscopic) trichomes 0.05–0.10 mm, unicellular, clavate and antrorsely bent or appressed, present throughout; larger trichomes (0.2–)0.4–0.6(–0.8) mm, unicellular, cylindrical and pointed, slightly bent antrorsely. Stem perennial with little secondary growth, terete or subterete but drying strongly obtusely sulcate, glabrescent below, sparsely to lightly pubescent above with trichomes 0.25–0.6 (–0.7) mm, pubescence often restricted to one side of stem; posture of shoot apex straight, negatively geotropic. Stipules (3.5–)5–14(–20) × (2.5–)3–8(–9) mm, ovate, with ca. 5–7 veins departing from stem, the midvein only slightly off center (stipule only slightly oblique), apex acute, often apiculate, margins ciliolate-setose. Petioles (0.6–)1–3.5(–4.6) cm, eglandular, slightly canaliculate and adaxially pubescent (at least distally) with trichomes (0.2–)0.3–0.5(–0.6) mm, abaxially glabrescent with only microscopic trichomes. Laminas 2.8–10(–12) × 4.0–15(–17) cm at fertile nodes, with 5 primary veins, 3-lobed ca. ¼–½ the distance to the shallowly cordate base, the lobes triangular to deltate or ovate, long-acuminate to caudate, the angle between the lateral lobes (120–)125–160 (–170)°, the central lobe longest, with the ratio of lateral to central lobe lengths (0.68–)0.75–0.90 (–0.95), the ratio of laminar width to length 1.30–1.65(–1.75), adaxially nearly glabrous or glabrescent with a few (0.2–)0.3–0.6(–0.8) mm trichomes restricted to the primary veins, abaxially sparsely to lightly puberulent with microscopic trichomes 0.05–0.06 mm; laminas not variegated (except trace of pericostal whiteness seen on very few leaves at distal flowering nodes of *MacDougal 316*); laminar nectaries absent; seedling and juvenile laminas depressed obovate or narrowly transversely rhombic/elliptic, more shallowly 2–3-lobed, the angle between the long-acuminate lateral lobes 105–120° in seedlings and 160–170° in juveniles, central lobe shortest (or reduced to a cusp), with ratio of lateral to central lobe lengths 1.25–2.8, ratio of laminar width to length 2.0–5.7. Tendrils straight

during development at shoot apex, often suppressed on fertile determinate axillary branches. Prophyll of vegetative ramifying bud 1, narrowly ovate, acute. Peduncles (5–)8–19(–23) mm, geminate or occasionally solitary, uniflorous, ebracteate. Flowers ca. 1.5–2 cm diam.; hypanthium 4–5.5 mm diam. with 5 retrorse spurs 0.4–0.8 mm long between bases of sepals, or sometimes spurs obsolete; stipe (2.0–)3.0–5.0(–8.0) mm; flowers borne between horizontally and erect, pale to light yellow-green except as noted, nearly inodorous; sepals (6.5–)7.5–9.0 × 2.3–3.9 mm, broadly lanceolate, rounded at apex, the 2–3 outermost cucullate and with a (0.5–)0.8–1.2 mm blunt subapical cornus, often abaxially flushed with very deep red to purplish red; petals absent; filamentous corona in 2 series, the outer filaments ca. 29–31, 3.0–4.0 mm long, 0.2–0.3 mm diam., filiform, widest at base, slightly attenuate distally, reflexed above the middle and the tips often slightly incurved, yellowish green at base, light yellow distally; inner series (0.7–)1.0–1.5 mm, capillary to subclavate, suberect; operculum 1.5–2.0 mm, membranous, plicate, sometimes with an inconspicuous narrow purplish band near middle, apex white-papillose; nectary trough without raised annulus; limen (disk) not colored or spotted; staminal filaments connate (2.5–)3.0–3.6(–4.0) mm along androgynophore, the free portions ca. 3 mm, spreading but not perpendicular to androgynophore; anthers 2.2–2.7 mm, oriented perpendicular or nearly so to their filaments at anthesis; ovary 1.5–1.9 × 1.0–1.4 mm, ellipsoid to widely ellipsoid, glabrous; styles ca. 4–5 mm, filiform, typically geniculate above middle; stigma capitellate, 0.7–0.9 mm diam. Fruit 10–13(–16) × 9–13(–14) mm, widely ellipsoid to subglobose or slightly obovoid, pericarp bluish black, glaucous, insipid; arils only half the length of the seed, firm, whitish or grayish, insipid; seeds 4.6–5.0 mm long, (2.9–)3.1–3.5 mm wide, (2.0 –)2.2–2.5 mm thick, reticulate-foveate with (15–)18–21(–24) foveae per side, obovate to widely obovate or subpyriform, the chalazal beak obtuse or obsolete, the micropylar beak obtuse or often somewhat oblong and blunt.

Additional specimens examined. EL SALVADOR. AHUACHAPAN: nebelwald region, Cerro Grande de Apaneca, ca. 1,700 m, 26 Aug. 1958 (fl), *Weberling 2610* (M—2 sheets). SANTA ANA: disturbed cloud forest near top of Cerro Verde, 30 July 1977, *Croat 42222* (MO); cloud forest, Mountain Cerro Verde, 1,800 m, 20 Feb. 1968 (fr), *Molina & Montalvo 21514* (F, NY). HONDURAS. SANTA BÁRBARA: bosque nublado, Cerro Santa Bárbara, cuestas de piedra caliza, 10 km E of Lago Yojoa, 14°55′N, 88°05′W, 1,500–2,000 m, 28–30 Apr. 1973 (fl, fr), *Clewell & Hazlett 3858* (MO, TEFH). GUATEMALA. EL PROGRESO: Montaña Canahuí between Finca San Miguel and summit of mountain, near upper limits of Finca Caieta [ca. 14°59′N, 89°54′W], 1,600–2,300 m, 10 Feb. 1942, *Steyermark 43787* (BR, F). GUATEMALA: Finca Nacional "La Aurora," 1938–1939, *Aguilar 89* (F); cerca encino y *Pinus maximinoi*, Choacorrán, km 20 a San Juan Sacatepéquez, 2,000 m, 17 Sep. 1982 (fl), *J. Castillo et al. 82.347* (F); moist thickets in deep ravines, vicinity of San Andrecillo, 1,700 m, 26 Sep. 1972 (fl, fr), *Molina & Molina 27543* (ENCB, F, US); ravine near Canales, 1,900 m, 25 Jan. 1947 (fr), *Williams & Molina 11822* (F). JALAPA: Volcán Jumay, N of Jalapa, 1,300–2,200 m, 1 Dec. 1939, *Steyermark 32352* (F). QUEZALTENANGO: cultivated at Duke University 1978–1982 from roots collected 2.5 mi. below tunnel at Santa María de Jesús, between Km posts 202–203 on Hwy. 9S, July 1978, *MacDougal 316* (AAU, BM, DUKE, F, HUA, MEXU, MO, USCG); moist forest at and above Aguas Amargas, slopes of Volcán de Zunil, 2,430–2,850 m, 17 Feb. 1939, *Standley 65404* (F); wet hillside forest, Aguas Amargas, western slope of Volcán de Zunil, 2,450 m, 14 Jan. 1941 (fl), *Standley 83336* (F); damp thicket along road above Santa María de Jesús, ca. 1,680 m, 25 Jan. 1941 (fr), *Standley 84846* (F, US); densely forested white sand quebrada, El Pocito, S of San Martín Chile Verde on road to Colomba, 2,200 m, 27 Jan. 1941, *Standley 84997* (F, G—2 sheets); damp dense mixed forest on white sand slopes above Mujuliá, between San Martín Chile Verde and Colomba, 1,800 m, 1 Feb. 1941, *Standley 85571* (F); thickets on slopes and ridges between Quebrada Chicharro and Montaña Chicharro, on SE-facing slopes of Volcán María, 1,300–1,400 m, 18 Jan. 1940 (fl, fr), *Steyermark 34360* (F); western slopes of Volcán Zunil, opposite Santa María de Jesús, 1,500 m, 21 Jan. 1940 (fr), *Steyermark 35094* (F). SAN MARCOS: wet forested quebrada, Barranco Eminencia, road between San Marcos and San Rafael Pie de la Cuesta, in upper part of the barranca between Finca La Lucha and Buena Vista, 2,500–2,700 m, 6 Feb. 1941, *Standley 86368, 86379* (F); thickets in pine woods in flat below cliffs along Río Malacaté, barrancos 6 mi. S & W of town of Tajumulco, NW slopes of Volcán Tajumulco, 2,300–2,380 m, 26 Feb. 1940, *Steyermark 36663* (F, US); montane cloud forest on outer slopes of Tajumulco Volcano, ca. 8–10 km W of San Marcos, ca. 2,300 m, 31 Dec.–1 Jan. 1964 (fl), *Williams et al. 26864* (F, GH, NY). SUCHITEPEQUEZ: Volcán Santa Clara, between Finca El Naranjo and upper slopes, 1,250–2,650 m, 23 May 1942, *Steyermark 46628, 46692* (F, US). ZACAPA: cloud forest in ravine bordering Quebrada Alejandria, summit of Sierra de las Minas, vicinity of Finca Alejandria, 2,500 m, 13 Oct. 1939 (seedling), *Steyermark 29859* (F).

The following common names are recorded from herbarium specimens: "granadilla de culebra" (Guatemala, Guatemala); "Hoja de murciélago," "flor de murciélago," "granadilla" (Quezaltenango, Guatemala).

Specimens of *P. eglandulosa* were not collected until after Killip's 1938 monograph, so the description there of *P. trinifolia* applies strictly to Masters's species. The description of *P. trinifolia* in Standley & Williams (1961), however, is a composite drawn from Killip and their observations of *P. eglandulosa*. *Passiflora eglandulosa* is superficially similar to the poorly known *P. trinifolia* by

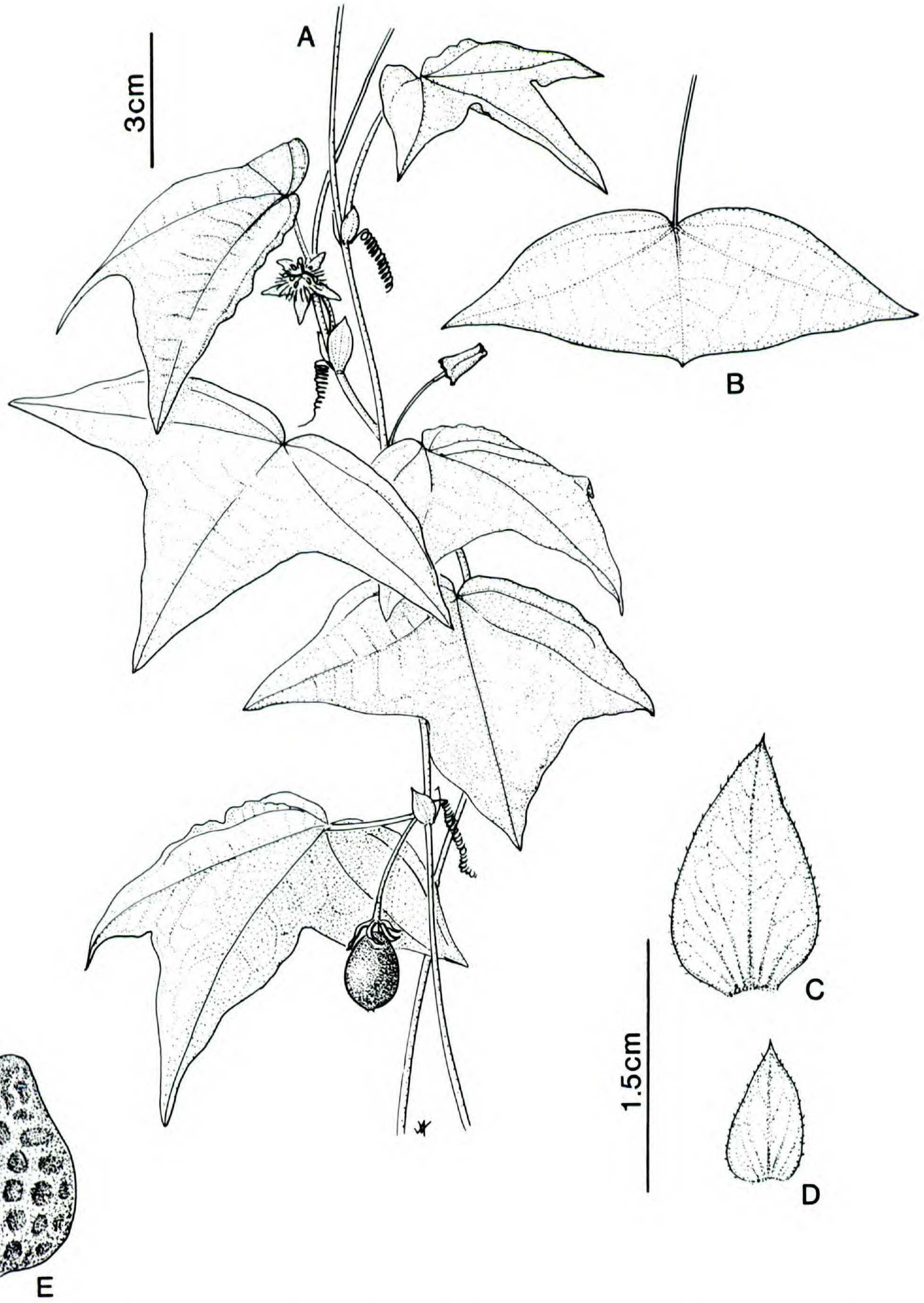

FIGURE 1. Passiflora eglandulosa *(from* MacDougal 316 *except as noted).—A. Habit.—B. Leaf from juvenile plant.—C. Stipule (*Clewell & Hazlett 3858*).—D. Stipule.—E. Seed (*Standley 84846*).*

having similarly three-lobed leaves and unusually broad stipules but is easily distinguished even in the herbarium by the absence of petiolar and laminar nectaries. Additionally, at fertile nodes the leaves of *P. eglandulosa* always have the central lobe longest; the laminas resemble those of the sympatric *Oreopanax sanderianus*. The leaves of *P. trinifolia* commonly have the central lobe shortest at lower fertile nodes. Leaves of juvenile plants are transversely bilobed in both species but are occasionally peltate in *P. trinifolia*, resembling miniature leaves of *P. coriacea* A. L. Juss. The leaves of juveniles are never at all peltate in *P. eglandulosa*.

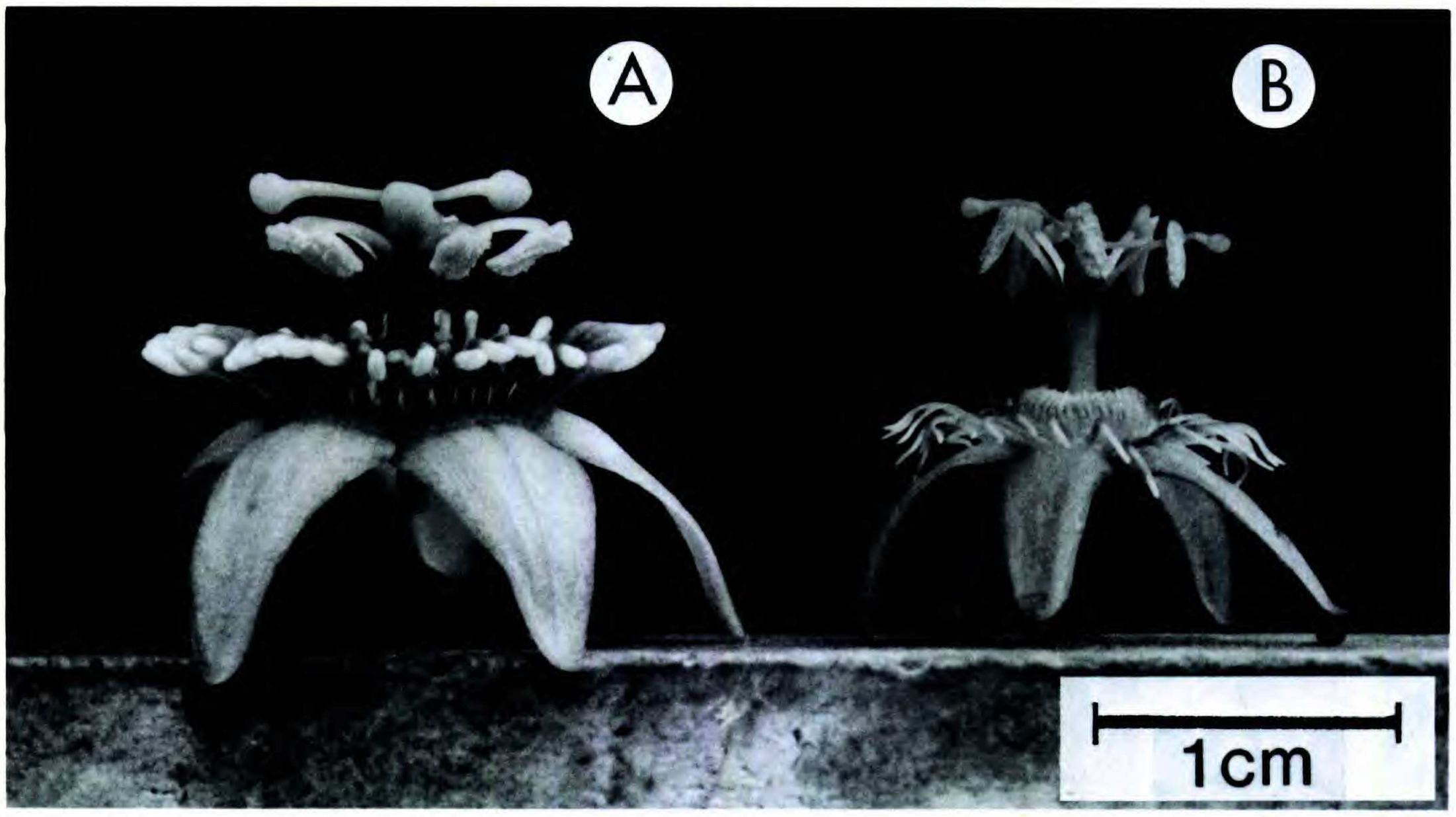

FIGURE 2. *A. Flower of* Passiflora trinifolia *from type locality (*MacDougal 637GR*).—B. Flower of* Passiflora eglandulosa *(*MacDougal 316*).*

Living material of both species was collected in the field by the author and grown at Duke University, allowing detailed comparison of the flowers (Fig. 2). *Passiflora eglandulosa* differs notably in having flowers oriented above rather than near or below the horizontal plane; buds slightly horned at the apex; sepals proportionally narrower; outer coronal filaments much finer and broadest at the base; inner coronal filaments not broadly capitate; limen smaller and unspotted; more gracile androecium and gynoecium; and anthers that present pollen distally to laterally instead of subproximally. This anther orientation is unusual in the section and genus as a whole, and may be associated with a mode of pollination different than that of the other species in the section.

The habits and habitats of the two species are remarkably different, and they are not sympatric (Fig. 3). *Passiflora eglandulosa* climbs to around four meters in shady ravines and at the edges of wet premontane to montane broad-leaved forest on the volcanic cones of southern Guatemala to central Honduras. The chartaceous leaves are bright green adaxially and usually exhibit drip tips. In contrast, *P. trinifolia* is known only from Baja Verapáz, Guatemala, from three stations within 12 km of each other. The habitat is open, strongly seasonally dry pine with oak forest, associated with grasses and agave. Although perennial, the species has annual shoots that are only up to 1 m long, and some fertile shoots may be but 0.25 m long. The leaves are dark green, without drip tips, and are very stiff and rigid.

Passiflora trinifolia is apparently self-incompatible, since 33 attempts to self-pollinate it in the greenhouse failed to yield fruit. Fully mature fruits are unknown in this species. *Passiflora eglandulosa*, on the other hand, proved to be significantly self-compatible but not autogamous in cultivation. No unpollinated flowers set fruit over several years of cultivation, but 10 of 18 self-pollinated flowers produced (1–)3–9 seeds per fruit. The fruits turned purple 40–44 days after pollination. Nine or 10

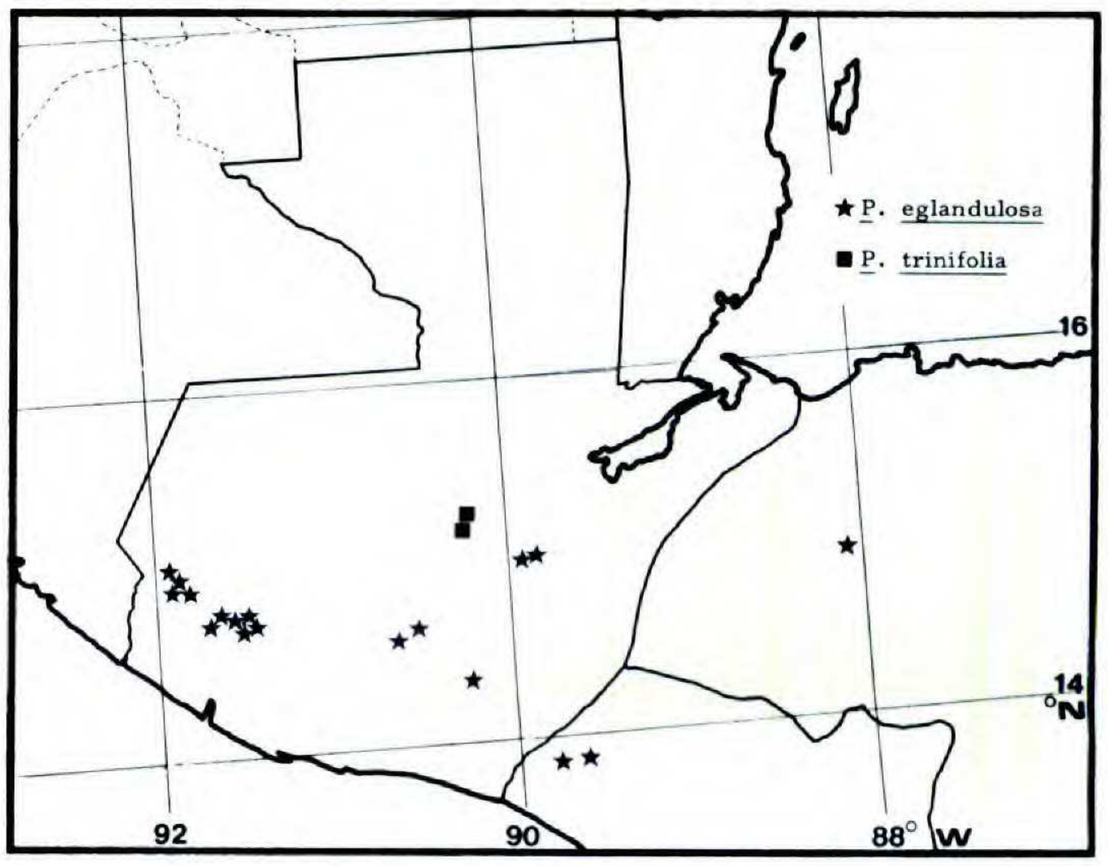

FIGURE 3. *Map of Guatemala and neighboring countries showing distributions of* Passiflora eglandulosa *and* P. trinifolia.

seeds per fruit appears to be the normal maximum for this species, judging from the several fruiting collections examined.

Passiflora eglandulosa (misidentified as *P. trinifolia*) has been included in three other studies of passionflowers. The development and physiology of the floral nectary of a clone of *MacDougal 316* was examined by Durkee et al. (1981), who found it to be similar to the others in their study. Dried leaf samples of *MacDougal 316* were chromatographically screened by McCormick (1982) for flavonoids. Concentrations were so low that no compounds could be verified, but according to McCormick (pers. comm.), traces of 3-*O*-glycosylflavonols but not *C*-glycosylflavones were detected. This is similar to several other species in section *Cieca*. Benson et al. (1975) reported the passionflower butterfly *Heliconius hortense* to be an herbivore of this species, a report that I confirm from field observations (insect voucher identified by J. Mallet).

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—John M. MacDougal, Missouri Botanical Garden, P.O. Box 299, St. Louis, Missouri 63166-0299, U.S.A.